

Utilizing Reverse Axillary Mapping in the Surgical Treatment of Axillary Hidradenitis Suppurativa: A Novel Approach

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Summary: Hidradenitis suppurativa (HS) is a chronic inflammatory cutaneous disease that imposes a surgical challenge and mandates radical, full-thickness excision of involved skin to achieve remission. Upper limb lymphedema can be a complication of HS chronic infection or radical surgery due to the violation of lymphatics. Reverse axillary mapping (RAM) was developed to reduce upper limb lymphedema after axillary surgery for breast cancer. We aim to demonstrate a novel approach by utilizing RAM during radical excision of axillary HS in 2 cases treated at Cleveland Clinic Abu Dhabi. By injecting isosulfan blue dye in the upper inner arm before surgery and observing the dye to map the lymphatic ducts, we clearly identified the blue lymphatic ducts in the surgical field and successfully preserved the dyed ducts while performing radical excision for axillary HS. In this report, we demonstrated the use of RAM in 2 patients with Hurley stage 3 axillary HS undergoing radical excisions. Identification of upper limb lymphatics with the aid of RAM was easy and instrumental in preventing damage to these ducts. Short-term follow-up did not show evidence of lymphedema or relapse of HS. The RAM technique enabled clear visualization of the lymphatic ducts located in our surgery field and prevented any possible lymphatic system damage in our cases. We suggest that RAM may be used as a routine in the surgical treatment of HS as well as in the popular bromhidrosis surgery to reduce the possibility of postsurgery upper limb lymphedema. (*Plast Reconstr Surg Glob Open* 2025;13:e6750; doi: 10.1097/GOX.0000000000006750; Published online 8 May 2025.)

INTRODUCTION

Hidradenitis suppurativa (HS) is a chronic inflammatory cutaneous disease affecting apocrine sweat gland-bearing areas. It can also lead to permanent dermal scarring and squamous cell carcinoma in advanced chronic cases.¹ Surgical procedures historically attempted for HS patients frequently aimed to alleviate symptoms and control sepsis (such as incision/drainage and deroofting), and rarely had curative intentions.² The radical excision

of HS is defined as full-thickness removal of all diseased and scarred skin with a margin of at least 1–2 cm. A recent systematic review showed a significantly lower rate of HS relapse when radical excision is applied.³

Lymphedema is a rare, yet underestimated complication of longstanding HS and can result even without surgery.⁴ Because HS frequently affects the axilla, surgery in this area can lead to disruption of upper limb lymphatic ducts, thereby putting the patient at risk for developing lymphedema.⁵

Reverse axillary mapping (RAM) was developed to visualize arm lymphatics to avoid their damage and mitigate the risk of lymphedema after axillary surgery for breast cancer.⁵

In this report, we aimed to demonstrate a novel utilization of RAM during radical excision of axillary HS to preserve lymphatic drainage. Four cases were treated using this approach at our tertiary referral center at Cleveland Clinic Abu Dhabi. Two cases are presented in this report.

CASE 1

A 36-year-old woman initially presented with a right axillary abscess that was misdiagnosed as a sebaceous

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cyst. She was found to have Hurley stage 2 HS with a self-draining abscess and proximal fistula involving the right axilla. She was initially treated with a course of oral antibiotics (sulfamethoxazole and trimethoprim 800 mg twice daily) with wound care and then scheduled for surgery after the resolution of the acute infection.

CASE 2

A 46-year-old woman was diagnosed with a longstanding Hurley stage 3 HS involving the right axilla. Her medical history was significant for morbid obesity and subsequent laparoscopic gastric bypass with significant weight loss. She had undergone multiple nonradical surgical interventions 3 years before her presentation with a relapse shortly after these procedures.

SURGICAL TECHNIQUE

Following induction of anesthesia, 2 mL of isosulfan blue dye was injected subcutaneously at multiple spots along the right medial upper extremity to achieve RAM. The HS area was marked for excision with a 1 cm margin of healthy skin (Figs. 1, 2). Complete excision was performed under loupe magnification by careful dissection of the affected tissue with identification and preservation of the blue lymphatics, which was observed to increase the operative time by 20–30 minutes more than the standard (Figs. 3, 4). The defect was reconstructed using an advancement flap to aid tension-free closure. After skin closure, negative pressure therapy dressing was then applied.

FOLLOW-UP AND SHORT-TERM OUTCOMES

Case 1

The patient had an uneventful postoperative course and was discharged home after 1 day with a portable



Fig. 1. Case 1: Intraoperative picture demonstrating the disease in the right axilla marked with a 1 cm margin of healthy skin.

Takeaways

Question: Can reverse axillary mapping aid prevention of lymphedema after radical excision of axillary hidradenitis? How feasible is it?

Findings: We found the mapping feasible and applicable in this context, with clear visualization of upper limb lymphatics, and they were easily preserved, aided by this approach

Meaning: Upper limb lymphedema can complicate axillary surgery for hidradenitis; reverse axillary mapping is a useful adjunct to our radical treatment approach.

vacuum dressing system. She was followed up in the clinic 1 week postdischarge and again 1 week later where moderate seroma was observed, leading to a 2 × 2 cm central gap in the wound that was treated with daily wound care and resolved completely within 1 month. She was seen again in the clinic 2 and 6 months postoperatively, with no lymphedema observed (according to standard circumferential lymphedema measurements for the upper limb).

Case 2

The patient had an uneventful postoperative course, and her wound was managed with a nonportable vacuum dressing system. On the seventh day postoperatively, the wound was exposed and found to be healing well, and she was discharged home. She was followed up in the clinic 2 weeks postdischarge and again in the clinic 4 and 6 months postoperatively, with no lymphedema observed (according to standard circumferential lymphedema measurements for the upper limb).

DISCUSSION

Management of HS remains challenging due to a lack of standard care and high rates of recurrence despite extensive multimodal treatment.⁶ Radical excision is a new approach in which the resection is full thickness and extends 1–2 cm beyond the visible and palpable diseased margin. This approach is recommended by the European S1 guideline and the HS ALLIANCE working group.⁷

Upper limb lymphedema in the setting of axillary HS has been observed and may result from violating the course of lymphatics while performing radical excisions. RAM is a well-known technique to identify and preserve lymphatic drainage pathways, thereby reducing the risk of postsurgical lymphedema in breast cancer patients undergoing axillary surgery.^{8,9} A randomized controlled trial evaluated RAM with axillary dissection for breast cancer versus traditional axillary dissection and demonstrated that the incidence of lymphedema in the study group was 4.2% compared with 16.7% in the control group.¹⁰

Learning the lessons from our experiences in using RAM in breast cancer patients, we have demonstrated in this case report the novel utilization of RAM to minimize upper limb lymphedema during radical excision of



Fig. 2. Case 1: The wound after radical excision of HS including preserved blue lymphatics.



Fig. 3. Case 2: Intraoperative picture demonstrating the disease in the right axilla marked with a 1 cm margin of healthy skin and the isosulfan blue dye injection spots.

axillary HS. To the best of our knowledge, this is the first report on the application of this prophylactic technique in the setting of HS. Initial results from this report may also suggest utilizing RAM while performing axillary skin excision for other indications such as bromhidrosis.

Isosulfan blue dye is a relatively safe product, with an incidence of adverse reactions ranging from 0.3% to 0.9%.¹⁰ As demonstrated in **Figures 3** and **4**, the visualized upper limb blue lymphatics are relatively superficial and delicate; they can be easily disrupted if not clearly visualized, especially in the setting of chronic inflammation and



Fig. 4. Case 2: Intraoperative picture displaying the careful dissection of diseased skin while preserving the blue lymphatics that are quite adherent because of recurrent infection.

scarred tissues. For more extensive and deep excisions where the lymphatics cannot be preserved, prophylactic lymphovenous bypass may be potentially performed. One limitation of this report is the short duration of the follow-up period, which is usually not sufficient to exclude developing lymphedema.

CONCLUSIONS

This report indicates that RAM may be effectively used as an adjunct and has the potential to reduce upper limb lymphedema following wide excision of axillary HS as well as other indications for axillary skin excision such as bromhidrosis. Large-scale prospective studies are required to further investigate the long-term impact on lymphedema prevention in the setting of HS.

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DISCLOSURE

The authors have no financial interest to declare in relation to the content of this article.

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